

GAS CHEMISTRY CYCLING TO ACHIEVE HIGH ASPECT RATIO GAPFILL WITH HDP-CVD

ABSTRACT OF THE DISCLOSURE

A method and apparatus are disclosed for depositing a dielectric film in a gap having
5 an aspect ratio at least as large as 6:1. By cycling the gas chemistry of a high-density-plasma
chemical-vapor-deposition system between deposition and etching conditions, the gap may
be substantially 100% filled. Such filling is achieved by adjusting the flow rates of the
precursor gases such that the deposition to sputtering ratio during the deposition phases is
within certain predetermined limits.

10

DE 7014498 v1